An Inaugural Essay:
for the degree of Doctor of Medicine;
in the University of Pennsylvania;
on Digitalis Purpurea:
by Horatio. N. Glentworth of Phila.
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Introduction

The subject which I have chosen for an inaugural essay, is one which has been within the last half century, a cause of much speculation and dispute among the medical world. Diversified even to a proverb, has been its fortune, on the one hand its virtues were extolled almost as a specific, whilst on the other its inertness has been equally maintained; "When doctors disagree who shall decide;" in this case – experience which has swept into the vortex of insignificancy both opinions. Upon a subject like this which has been canvassed by men of eminence, to attempt originality would be vain – "Toe to gild refined gold

To wasteful and ridiculous excess".

I therefore disclaim making any pretensions to it. I propose in this paper to give an account 1st of the Plant, 2d Mode of Exhibition, 3d Modus Operandi, 4th Therapeutical applica-

tion; these remarks must consequently be very brief, as a full account of any one of this division would swell this paper to a size incompatible with my object.

Division 1st.

Description of the Plant:

This is the Digitalis Purpurea of Linnaeus, it belongs to the second order of the fourteenth class, in the Didynamia Angiospermia of Linnaeus. It is a native of Europe, but may be successfully cultivated in any part of the United States, whether it loses any of its virtues by cultivation is a subject upon which much variety of opinion prevails; it is the opinion of Doctor Hamilton that it does not. This plant is a biennial and delights in dry, gravelly, sandy soil; particularly upon sloping grounds. It bears some resemblance to the common mullein (Verbascum). It flowers from the middle of June

to the end of July; the roots, stems, leaves and flowers have a peculiar herbaceous, nauseous, and acrid taste. Every part of the plant possesses similar properties, but the leaves are generally preferred and are said to be by far the more efficacious; they are slightly serrated, wrinkled, oblong, egg shaped, of a green colour above, but pale underneath. Chemical composition- extractive matter; and green resin in which its narcotic properties reside. Solubility both water and alcohol extract its virtues. Incompatible substances its solutions are precipitated by Chloride of Mercury, Nitrate of Silver, and by an infusion of yellow cinchona bark.

Division 2d

Mode of Exhibition

It may be given in Substance, Tincture, Infusion, Decoction; and Extract. When we wish the effects of a narcotic to be produced the

substance will be found preferable. When the object is to diminish the velocity of the pulse, or in cases where we wish it to be gradually introduced into the system; the saturated tincture as it contains "the virtues of the Foxglove in a very manageable form" ought be preferred. When diuresis is demanded Withering, Hamilton, and others of no less respectable authority, recommend the Infusion — as it admits of easy regulation in the dose according to the case, strength of the patient, and the effects produced. The decoction seems to have been little noticed by authors; the mode of preparing it is one which has a tendency to destroy many of its most active properties rendering it comparatively inert and causing much variability in the dose. Of the extract I shall only remark that a medicine whose largest dose scarcely ever exceeds three grains can stand in need of little

condensation.

Division 3d

Modus Operandi

The question whether Digitalis is stimulant or sedative in its primary operation, is still a subject of much controversy; the exuberance of fancy, and the love of singularity have suggested many theories to account for the peculiar action of this medicine, but such speculations even if they possess the property of being intelligible have been productive of little advantage; if any man "says a writer" were inclined to write a satire on medical Evidence, the views respecting the operation of this single plant would furnish abundant materials. It does not become one just entering into the profession to decide upon those points upon which men of eminence clash and so widely; yet I cannot suppress my opinion

that Digitalis is directly stimulant; restricting the meaning of the word, and indirectly sedative; but that the stimulant effects are in no way proportionate to the ultimate sedative influence - the analogy in this respect between Opium and Digitalis I think very striking. Many of the phenomena attending the operation of this singular plant, can only be attributed to its influence over the Nervous System; for me to attempt explaining the peculiarities of it would be absurd and ridiculous - this is reserved for ages yet to come, or at least untill physiologists have acquired a better knowledge of the functions of the Nervous System and its influence over the Arterial. The operation of Digitalis over the Arterial System is very great as repeated Experiments clearly prove - diminishing the velocity of the pulse in some instances to half its natural standard; if any man says Ferriar

had expressed an opinion a few years ago that were
discover a medicine capable of reducing the pulse
without danger from 120 in a minute to 75 or 80 at
the will of the practitioner, he would have been
ridiculed as a visionary; and he continues this
plant furnishes us the means of regulating the
pulse to our wish and of supporting a given state
of velocity as long as we judge proper. The
state of the pulse varies also according to the
position of the patient's body; this singularity was
first noticed by Dr. Bedaoes and published in 1807
in the Medical and Surgical Journal, this experi-
ment he first tried upon himself, having got his
system under its full effects; upon standing erect
his pulse beat 100, upon sitting down much slower,
and when lying on his back it fell to 40. this
he frequently repeated upon himself and others and
always attended with the same results; I have
paid much attention to this subject says Doctor

Hamilton without being able to convince myself of the fact in question, but I believe the variation in the pulse will rather be found to accompany debility in general than to depend upon the particular influence of Digitalis: as a proof of it, he relates a case in which as the patient advanced in strength it entirely ceased. From its extraordinary effects over the circulatory system; the absorbent is called into play, and upon this action many of its greatest medicinal effects depend and especially its operation as a diuretic; to strengthen this opinion - that Digitalis does not specifically on the kidneys act; I will quote the high authority of Doctor Chapman - whose opinion upon all subjects is equally respected and admired - it seems "says he" to be one of those diuretics that act directly on the absorbent system having little or no relation to the kidneys. Concluding my remarks on

the Modus Operandi I will only add; that I think Digitalis by diminishing the frequency of the Heart and Arteries; consequently diminishes the irritability of the system; increases the action of the Absorbents: and the discharge by urine.

Division 4th

Therapeutical Application

Reasoning a priori from the operation of Digitalis upon the absorbents, its use in hydropic affections would seem to be indicated; at any rate, of all the dis.s in which it has been Employed its reputation in dropsies is the least disputed; The practice of prescribing it in dropsical Cases originated with Withering; about the year 1775, he was induced to Employ it from having seen it used as a domestic Remedy. So highly did Withering estimate its powers that he says so far as the removal of the water

will contribute to cure the patient, so much may be expected from Digitalis. This practice was soon made known and imitated by many and among the number the distinguished names of Percival, Baker and Darwin stood conspicuous. The indiscriminate administration of this remedy in dropsies regardless of the patients pulse, symptoms &c. has had a tendency greatly to diminish its reputation; Withering says that in persons of tense fibre and great natural strength the medicine seldom succeeds, while on the contrary if the pulse is feeble or intermitting, the skin cold; it hardly ever fails to do good. The encysted form of the disease excepted: Digitalis may be prescribed in all the other varieties. On account of the diversity of opinion it is difficult to determine in what forms of these dis.s Digitalis is found most efficacious; every practitioner has a greater predilection for it in

some one of its forms than in others; arising no doubt from having seen cases of the one, more frequently than the others. Hamilton strongly recommends it in Hydrothorax not however condemning its Exhi=bition in the other forms; he says that he has never seen one case however far advanced; or desperate, that was not speedily relieved by it; experience has however shown the fallacy of this enthusiastic statement. It is thought by Doct: Chapman - to be equally useful in Hydrothorax, Anasarca, and Ascites: certain I am he continues that I have done very good with it in Hydrothorax than in other dropsies; under circumstances equa=lly favourable. In Hydrops Pericardii: Hamilton affirms that it will rarely disappoint the Ex=pectations of the practitioner; in this case says Dr Chapman I fully coincide - as to the great efficacy of Digitalis. I cannot dismiss my remarks on the Therap: application of Digi=

talis in dropsies without inserting the flattering opinion of Currie in its favour; this medicine "says he" may almost be said to be possessed of a charm for its efficacy in some kinds of dropsies; especially Hydrothorax: its introduction into medicine, is one of the greatest benefits our science has received in modern times. In organic affections of the heart and large arteries arising from, or depending upon hydropic effusions or depositions impeding the natural functions &c Digitalis will no doubt considerably alleviate symptoms and prolong life. The pathology of hemorrhage clearly indicates the advantage in certain states of these dis.; to be derived from the exhibition of Foxglove: I have reference to those hemorrhages from internal organs or what may perhaps be more strictly denominated idiopathic hemorrhage; previous to an effusion some febrile irritation

is felt; the pulse quick, hard, and full; but after effusion has taken and a considerable quantity of blood lost: the pulse becomes more natural and less frequent, the force of the circulation al=
=though diminished; is still more rapid than in health, the cause being removed the vessels are unable to resist the vis a tergo, and a repi=
tition of the attack ensues; to deplete under such circumstances would be hazardous, at this critical moment Digitalis is said to act like magic: and fortunately "says Hamilton" it sel=
dom disappoints our expectations; the effects produced can be kept up untill the vessels shall have regained their powers of resistance. Of its supposed influence over Inflam.ty diseases: and of its superseding the lancet, I shall say little; absurd and ridiculous however as this practice was, it had its votaries among whom might be ranked Currie and Mosman; the

former states, that he has employed and succeeded with it in cases of inflammations of the brain, lungs &c which he should otherwise have despaired of relieving - the latter says that pneumonic inflammations may be overcome by it; with as much certainty as fever by bark; these gentlemen's imaginations must have deceived their better judgements or there must have existed in their day patients of such idiosyncrasies as are seldom to be met with at the present time. In chronic cases of these affections after sufficient depletion &c has been attended to; Digitalis in small doses as an alterative would no doubt have had a beneficial tendency. I shall conclude with a few remarks upon its application in Consumption; so much was at one time confided in it that even the last stages - Ulcerations, Disorganizations, Hectic; and all its concomitant symptoms: formed no obstacle to its remedial powers; Beddoes says

that he has seen patients advancing towards recovery with so firm a pace, that he expects consumption will be cured by Foxglove, with as much certainty as fever by bark. Drake also states that he has seen many cases of confirmed phthisis cured by it, and almost all relieved; life has ever been protracted by it, and when death has taken place it has been free from pain or struggle. When the disease is attacked in its incipiency before purulent expectoration has taken place with due regulation to regimen, idiosyncrasy of constitution &c it may "says Reid" be administered with a prospect of almost invariable success; but it has like all other medicines limited powers, and when the substance of the lungs has become involved it ~~will~~ will like all other remedies prove abortive: this opinion I believe is sanctioned by most practitioners of the present day; I will only sug-

=gest in conclusion that emanating as the effic=
=acy of Digitalis in the cure of consumption does:
from men of such distinction, I think it me=
rits as trial as a dernier resource in all cases
however far advanced or desperate. An appeal
must now be made to the generosity of the
Professors of this Institution in behalf of this
imperfect Essay; and I flatter myself; when it
is taken in consideration its being the produc=
tion of a juvenile mind impelled by necessity
and not choice: the appeal will not be made
in vain.—